been published in the Philosophical Transactions. Dr. Young is also the author of the articles on "Distillation," "Sublimation," and "Thermometry" in Thorpe's "Dictionary of Applied Chemistry."

NOTES.

MR. CHARLES CHREE, Fellow of King's College, Cambridge, has been selected to fill the important office of Superintendent to the Kew Observatory. It is one for which the combination of high mathematical capacity with a practical experience of the apparatus and methods of physical research is especially needed. Mr. Chree obtained in 1884 the hitherto unequalled honour of a first class in the most advanced parts both of the Mathematical and of the Natural Science Triposes, and he has since been much engaged at Cambridge in experimental and mathematical investigations. The results of these are published in the *Cambridge Philosophical Journal*, and in the "Philosophical Transactions" of the Royal Society.

THE "James Forrest" lecture will be delivered at the Institution of Civil Engineers this evening by Mr. William Anderson, F.R.S. The subject is the interdependence of abstract science and engineering.

SIR W. H. FLOWER, F.R.S., will preside over the fourth annual meeting of the Museums' Association, which will be held in London in July. The meeting, which will last for several days, will begin on Monday, July 3.

AT the meeting of the Victoria Institute on Monday a paper by Prof. Maspero was read in the author's absence by Mr. T. G. Pinches, of the British Museum. The paper embodied the results of Prof. Maspero's investigations during the past ten years as regards the places in Southern Palestine claimed, according to the Karnac records, to have been captured by the Egyptians in the campaign under Sheshonq (Shishak) against Rehoboam.

THE report of the Council of the City and Guilds of London Institute has just been published. We are glad to note that they are "able again to point to steady and continued development in each branch of the Institute's work, as shown by the statistics of their colleges, and—what is more satisfactory—by the positions taken by their students, as the result, to a large extent, of the instruction provided."

THE tercentenary of the foundation of the Botanic Garden of Montpellier will be celebrated by *fêtes* from the 20th to the 28th of May, when the Botanical Society of France will hold its special annual session in the town. The botanists of Montpellier offer hospitality to foreign botanists who may desire to attend the *fêtes*.

SINCE the death of Dr. Prantl the editorship of the cryptogamic bi-monthly *Hedwigia* has been undertaken by Dr. G. Hieronymus, Herr P. Hennings, and Dr. G. Lindau.

UNDER the auspices of the Imperial Academy of Sciences in Vienna, Dr. E. v. Halácsy, and Prof. Hilber have undertaken a botanical and geological investigation of Mt. Pindus in Thessaly in the course of the present year.

PROF. MARTIN, on account of his serious and prolonged ill-health, has tendered his resignation of the professorship of biology, which he has held in the Johns Hopkins University since 1876.

A NEW journal of experimental and theoretical physics, called *The Physical Review*, and conducted by Edward L. Nichols and Ernest Merritt, will be published for the Cornell University by Messrs. Macmillan and Co., New York and London. The first number will appear on July 1. The new journal will be issued bi-monthly, and each number will consist of at least sixty-four pages. It will be devoted to the promotion of original work in physics.

THE Camera Club has issued a "Conference Number" of its Journal, in which an account is given of the proceedings of the Photographic Conference, held lately at the Society of Arts.

SINCE our last issue the temperature has appreciably decreased over these islands; the maxima have only reached 70° occasionally in the southern and central parts of England, while in all other districts the thermometer has seldom risen above 60°. Up to Tuesday, the 2nd inst., the rainfall had only been slight, the greater part being confined to the northern and western parts of the country, where small amounts have been of frequent occurrence. The recent drought has been probably unprecedented in some parts; at places on the south coast no rain had fallen for forty-five days, while in the neighbourhood of London there were thirty days without rain. The type of weather has recently undergone an entire change; cyclonic disturbances formed in and near our islands, while the anticyclonic conditions temporarily disappeared. With this change in the distribution of atmospheric pressure, the northerly and easterly winds gave place to those from westerly and southerly directions, unsettled and showery weather became general over the whole country, and the softer quality of the air was very perceptible. Notwithstanding the decrease of temperature, the *Weekly Weather Report* of April 29 showed that it was above the mean in all districts, the excess varying from 3° to 5° in the north and west, to 6° or 7° in most parts of England. The rainfall for the week was, of course, less than the mean in all districts, while bright sunshine was very prevalent over the entire kingdom; in the Channel Islands the percentage of possible duration was as high as 81, and in all districts it greatly exceeded the average.

DR. PAUL SCHREIBER has communicated to the *Meteorologische Zeitschrift* for April an account of some extraordinary snowballs which fell at Glashutte, in Saxony, on December 4 last. After a storm which had lasted ten minutes, a calm suddenly occurred, and light balls of snow measuring from four to five inches began to fall. The balls lay on the ground until the next day, there being from five to twelve of them to a square yard. Dr. Schreiber thinks that the phenomenon was of an electrical origin, as the preceding disturbance seemed to point to a thunderstorm.

PROF. HELLMANN, to whom meteorologists are so much indebted for many laborious investigations into the history of old observations and instruments, has recently made an important addition to early meteorological literature by the publication of *Das älteste Berliner Wetter-Buch*, containing observations made in Berlin in 1700–1701, by Gottfried Kirch and his wife, being the first part of a manuscript of over 1000 quarto pages. During the preparation of Dr. Hellmann's valuable work on the climate of Berlin he had made constant search for these observations, which were known to have been in Berlin about fifty years ago, and he at last discovered them, strangely enough, in the Crawford Library at the Edinburgh University. It is well known that Lord Crawford (then Lord Lindsay) took an interest in collecting works on comets, and these old manuscripts contained a number of such observations, in addition to meteorological data. Dr. Hellmann's account of the search for, and the discovery of, the manuscript, and of the antecedents of the Kirch family, is exceedingly interesting.

IN the *Annales* of the French Meteorological Office, recently published for the year 1890, M. Angot has discussed the observations taken simultaneously during that year at the Central Meteorological Office and on the Eiffel tower, and has arrived at some interesting results respecting the variation with height of the several meteorological elements. The reduced barometric pressure was lower every month on the tower than on the ground, the probable cause being the great difference in the velocity of the wind at the two stations. The observations made at the three stations on the tower allow of the variations of temperature with altitude being studied with great detail, and it was found that the rate of diminution was far from being proportional to the height above the ground. In all months, at the middle of the night-time, the temperature increased with altitude, the maximum difference occurring at a mean height of about 500 feet, it then decreased at first slowly, and afterwards more rapidly; at about 1000 feet the mean rate of decrease already amounted to 1°·4 per 100 metres (328 feet) During the middle of the day-time the decrease of temperature with height above 500 feet is nearly uniform in all months, being about 1°·6 for each 100 metres. Between 500 feet and the ground, however, the decrease showed a marked annual variation; during the cold season the difference was less than that observed at the higher level, while in the hot season it was much greater. The diurnal variation of vapour tension at the summit of the tower exhibited entirely different characteristics from those near the ground; generally speaking, there was only one maximum, near noon, and one minimum, between the evening and midnight. During all months the vapour tension was less at the top of the tower than near the ground. The diurnal variation of the wind exhibited a marked minimum at the top of the tower during the day-time, and a maximum at night, being the reverse of what is observed at ground stations.

THE Board of Agriculture has issued a valuable report on rust or mildew on wheat plants. It contains a complete account of the life-history of the fungus of ordinary mildew, *Puccinia graminis*, as well as of that of spring rust and mildew, *Puccinia rubigo vera*, with a discussion of the conditions favourable for their propagation, and the best means of averting them. It is illustrated by some excellent coloured plates by Mr. Worthington Smith.

RATHER less than three years ago (NATURE, vol. xlii. p. 297) we had to record the death of Mr. W. K. Parker, and in doing so we gave some account of the main facts of his career. An excellent little biographical sketch of him by his son, T. Jeffrey Parker, has just been published by Messrs. Macmillan and Co. In an introductory letter Prof. Huxley speaks of the volume as one which "gives a presentation as accurate as it is vivid, of a man of noble and lovable character, endowed with intellectual powers of a very unusual order." Prof. Huxley says he has "never met with another such combination of minute accuracy in observation and boundless memory for details, with a vagrancy of imagination which absolutely rioted in the scenting out of subtle and often far-fetched analogies." "The genius of an artist struggled with that of a philosopher, and not unfrequently the latter got the worst of the contest."

AT the instance of some Russian meteorologists, who have frequent occasion to measure very low temperatures, M. Chappuis lately undertook a study of the spirit thermometer (*Arch. de Sciences*). He traces its anomalies to three sources. (1) Adhesion of the liquid to the walls of the capillary tube. When the instrument is brought from ordinary temperature to a lower, the sinking column leaves liquid on the tube, which for hours, and even days, continues slowly descending. (2) Irregular expansion of the spirit with the temperature. As the expansion increases with heating, the graduation should be made to correspond, the degrees for higher temperatures being longer (which is not usually the case). (3) Impurities in the spirit, and varying water-content, which affect expansion materially. M. Chappuis recognises the difficulty of getting rid of these faults, and concludes that alcohol is not to be recommended as a liquid for thermometers marking low temperatures. On the other hand, it has been shown that toluol (with a boiling point of about 110° C.) is a liquid well adapted for the purpose and free from the disadvantages referred to.

LAKE MEMPHRAMAGOG—the Loch Lomond of Canada—lies partly in the State of Vermont, but belongs to the St. Lawrence hydrographic system. It is thirty miles long, and varies from one to four miles in breadth. It lies in the lap of high hills, and is a deep-water lake, soundings in one locality indicating depths, it is claimed, of 600 ft. Mr. A. T. Drummond writes to us that from readings taken on August 10 last, at 11 a.m., under a strong sun and cloudless sky, two facts appear to be established:—(1) that Lake Memphramagog is a cold-water lake whose bottom temperatures are in August as low as 44°·75 Fahr.; (2) that the high surface temperature is only maintained for relatively a few feet, beneath which the mercury falls rapidly towards the lowest reading. There is a decided surface current at the southern end, arising from the inflowing streams there, and it is suggestive that the warm waters from these streams flow, river-like, over the colder waters of the lake, just as the Gulf Stream, under a different influence, but lightly skims the surface of such a large portion of the broad Atlantic Ocean. Whilst the thermometer at twelve fathoms registered 51°, the waters of Lake Ontario, at their outlet into the St. Lawrence indicated at the same depth, and at about the same period, 67°.

THE green colour in certain oysters, localised in the gills and palps, and lost under certain conditions, is known to be due to an insoluble pigment introduced by a diatom on which the oysters feed. It has been shown lately by M. Pelseneer, of Ghent (*Rev. Sci.*), that a process of "phagocytosis" here occurs. The pigmentary granulations are an injurious product in the blood; and they are devoured by the blood corpuscles, which, thus charged, pass into the gills and palps, where the blood is separated from the outer water by a mere thin layer of epithelium. The corpuscles penetrate between the epithelia cells, where some are destroyed, and some pass right through and escape. It is thus explained how green oysters placed in water without the diatom referred to lose their colour very quickly (in thirty-six hours at most), the charged corpuscles being rapidly eliminated.

THE success of the luminous fountains at the Paris Exhibition of 1889 suggested to M. Trouvé the idea of producing the effects on a small scale and cheaply. Several forms of this small fountain are described in the *Bulletin de la Société d'Encouragement*. Instead of illuminating the water jets by lateral mirrors, M. Trouvé lights up with an incandescent lamp at the focus of a parabolic mirror a sort of inverted glass with apertures for the liquid. M. Trouvé also here describes his method of imitating lightning at one of the Paris theatres. Instead of flashing lycopodium powder behind a broken line cut in the scenery (the old plan), a long bamboo or other flexible rod is used, having a small incandescent lamp of great brilliancy at the end, with a foot commutator, enabling one to make or break the circuit at will. The rod is moved quickly down in a zigzag direction at the proper moment. The sound of the wind in a storm is imitated by means of a double-action pump and two sirens; and that of hail by throwing coarse sand against an osier screen.

A SIMPLE optical photometer, serving also to measure the degree of visual power, has been devised by Dr. Simonoff

(*Moniteur de la Photogr.*). A series of twenty-four pages is arranged, the first having a clear grey tint, the second one of double intensity, and so on to the twenty-fourth, the tint of which is nearly black, being twenty-four times more intense than that of page 1. On each page are printed a few phrases in black letters of different sizes. In a badly lit room one may estimate the amount of illumination by turning over the leaves of this little book, held about a foot from the eyes, until one can no longer read the line of letters of a selected size. With good illumination you may proceed to the twentieth or twenty-fourth page, but with poorer light you may be stopped at the tenth, or twelfth, or fifteenth. The instrument is for indoor use exclusively. In schools it might prove useful in testing the vision of children.

A PERIODICAL which will show what natives of India can do in some branches of science has been started in Bombay. It is called *The Indian Medico-Chirurgical Review*, and is edited by N. A. Choksy. We have received the third number, in which several native writers record the results of original observation, while there are many good notes on work being done in Europe. In one article the *Review* urges the necessity for the establishment of a teaching university in Bombay. As the teaching of law, medicine, and science in the presidency is practically located in the city of Bombay, and hence in touch with the existing examining University, a few professorships might, the *Review* thinks, be endowed, and eminent men invited from Europe to occupy the new chairs. The *Review* also suggests that the Government might with advantage "copy the system of the German Universities by establishing biological, physiological, pathological, bacteriological, and hygienic institutes, in connection with these professorships, and place over them professors who would go on teaching and at the same time carry on original researches."

IN the report of the Geological Survey of India for 1892 reference is made to Dr. Noetling's visit to the amber and jade mines of Upper Burma—a visit which was rendered possible by the starting of the Maingkwan column. The so-called amber turns out to be a new variety of this form of fossil resin, to which the name of Burmite has been assigned by Dr. Noetling in conjunction with Dr. Otto Helm (a distinguished authority in this line) of Danzig, to whom specimens were forwarded. The peculiarity of Burmite is a fluorescence, giving the mineral an appearance as of solidified kerosine oil: and, as far as has yet been seen, it is of darker colours than is usual with amber proper (succinite); while it is a little harder than the latter. The colour alone is, according to the present fashion in Europe, against the mineral, but some of the darker varieties of brown red colour, present on being cut deeply *en cabochon*, the flat or under face being turned to the observer, a really gorgeous ruby tint which should make the stone desirable ornamentally. The so-called jade—for the actual constitution of the mineral as worked in Burma determines it properly as *jadeite*—is worked by pit and quarry mines, the former for forty miles along the bank of the Uru river southwards from Sankha, while the latter are excavated on the top of a plateau at Tammaw, eight miles out of Sankha, in the Mogoung subdivision. The industry seems to be a thriving one, and rather promising for future more systematic and skilled development, for at least 500 men are engaged every season in working the quarries. White is the commonest colour, the green varieties being of much rarer occurrence; while, in some of the fewer boulders obtained from the laterite beds along the course of the Uru river, a "red jade" appears to have been produced by ferruginous decomposition change.

THERE are two stations in Italy for the economic investigation of the diseases of plants; one at Pavia, established in 1871 in connection with the Botanical Institute of the Royal University, and now under the directorship of Prof. Briosi; the other at Rome, established in 1887, and presided over by Prof. Cuboni. They are required to investigate the nature and cause of diseases, to test and provide remedies, and to disseminate information by lectures and publications. As might be expected, the diseases of the vine and of the olive occupy a large share of their attention.

PROF. V. DVORAK, of Agram, uses a very simple apparatus for demonstrating the oscillation of the air in sound phenomena. In an ordinary resonating sphere the short neck is replaced by a small metal plate with a conical hole opening inwards, its shortest diameter being about 2 mm. When the resonator sounds, the passage of air through the hole is strong enough to extinguish a lighted match. If a small paper wheel resembling a water-wheel is placed a little below the opening and the resonator stands about 3 cm. in front of a wall, the blowing of a horn, or the singing of the proper note, is capable of setting the wheel in rapid rotation. A very serviceable lecture apparatus for measuring the intensity of sound is illustrated in the *Zeitschrift für Physikalischen Unterricht*. A narrow glass tube bent at a very obtuse angle is half filled with alcohol. One end of the tube has a conical opening, and this is placed at a distance of 0·5 cm. from the opening of the resonator described. The whole is mounted on a board capable of adjustment to any angle. The puffs emitted from the resonator when responding to a sound affect the level of the alcohol, and the displacements are read off on a scale attached to the tube, projected, if necessary, on to a screen. Another effect of sound easily observed is that of repulsion. A light resonator of the ordinary construction is floated on water, its axis being kept horizontal by means of an attached piece of wire. On blowing the horn, the sphere will float in the direction opposite to that in which the neck is pointed. To produce continuous rotation, four resonators are attached to a light cross of wood turning on a needle point, or one resonator with four bent necks is suspended by a thread. If this acoustical reaction wheel is placed in one corner of the lecture theatre, it can be set rotating from the opposite corner by a strong tuning fork, or even by singing through a conical tube.

AT the recent exhibition of the Société Francaise de Physique, M. Hurmuzescu showed the following experiment:—A metallic wire, through which a continuous current is passed, is stretched horizontally in a glass tube containing gas either at the ordinary atmospheric pressure or rarefied. As soon as the wire becomes red-hot it begins to vibrate in a vertical plane, and the containing tube becomes much hotter at the bottom than at the sides. This effect has not been satisfactorily explained by its discoverer.

M. CLAUDE showed at the same exhibition an instrument for measuring the difference in phase between the current in a circuit and the impressed electromotive force. The principle of the instrument is as follows:—When a piece of soft iron, fixed to the end of a spring, is placed before the pole of an electromagnet having a permanently magnetised core and traversed by an alternating current, it is attracted and vibrates with the same period as the current. If the spring also carries a mirror from which a ray of light is reflected on to a scale, the length of the band of light produced will be proportional to the maximum displacement of the mirror. Two such electromagnets are used, acting on the piece of soft iron in opposite directions, and at such distances that they produce the same maximum deflection, one magnet being placed in series with the circuit, and the other joined to the ends of a non-inductive resistance. Under these conditions the length of the band of light is proportional to the cosine of half the angle of lag.

An interesting note by M. Birkeland appears in the *Comptes Rendus* for April 17 on the reflection of electrical waves at the extremity of a linear conductor. By an application of Prof. Poynting's theorem concerning the movement of the energy in an electromagnetic field to the case of a Hertzian oscillator, he has shown how the damping of the oscillations depends on the nature and position of the conductors in the neighbourhood. He also accounts for the fact that, when the distance between the first stationary node and the end of a wire is determined by means of a secondary circuit, the value found is smaller than that obtained by a direct measurement of the potential along the wire, by showing that the paths along which the magnetic energy travels are extended beyond the end of the wire, so that the wave has, so to speak, to make a detour round the end of the wire, and is thus retarded.

An important new series of compounds, the thionylamines, in which two new hydrogen atoms of the amido group of the primary amines are replaced by the radicle thionyl SO, have been prepared by Prof. Michaelis, and are described in the current number of *Liebig's Annalen.* It has been found that the primary amines of the fatty series when dissolved in ether react with thionyl chloride, $SOCl_2$, in a manner which is readily controlled by extraneous cooling of the vessel in which the reaction is conducted. The products are the hydrochloride of the amine employed which separates in crystals, and the new liquid thionylamine which remains dissolved in the ether, but can readily be isolated by fractional distillation. Thionyl chloride is incapable of acting upon the hydrochlorides of the amines of the fatty series, hence three molecular equivalents of the amine are required for every equivalent of thionyl chloride, according to the following equation in the case of methylamine:— $SOCl_2 + 3(CH_3.NH_2) = CH_3.N:SO + 2(CH_3NH_2.HCl)$. The thionylamines of this series are colourless fuming liquids which boil without decomposition and emit a most powerful odour. They are decomposed by water into the original amines and sulphur dioxide. The amines of the aromatic series likewise form thionylamines with thionyl chloride; and the hydrochlorides, unlike those of the fatty series, react with equal facility in accordance with the equation $C_6H_5NH_2.HCl + SOCl_2 = C_6H_5N:SO + 3HCl$. It is only necessary to cover the powdered hydrochloride of aniline with benzene, add the calculated quantity of thionyl chloride, and warm over a water bath for a short time. The lower members of the aromatic thionylamines are yellow liquids which distil without decomposition; the higher members may likewise be distilled without loss under diminished pressure. Alkalies convert them into the original amines and a sulphite, $C_6H_5N:SO + 2\,NaOH = C_6H_5NH_2 + Na_2SO_3$.

Thionyl-methylamine, $CH_3N:SO$, the first member of the series, is most conveniently prepared by reacting with methylamine upon a solution of thionylaniline in toluene. The latter is first prepared and cooled by a freezing mixture; the methylamine should likewise be maintained at as low a temperature as possible until the moment of adding it to the solution of thionylaniline. After agitation and standing for some time the product of the reaction may be distilled, when thionylmethylamine is obtained as a colourless fuming liquid boiling at 58–59°. Its odour is not unlike that of bleaching powder. Thionyl-ethylamine, $C_2H_5N:SO$, may be readily obtained by mixing cooled ethereal solutions of thionyl chloride and ethylamine. The reaction even at this low temperature is very violent, occurring with hissing and the evolution of white fumes as each drop of the dilute ethereal solution of thionyl chloride falls into the solution of ethylamine. Ethereal solutions of thionylaniline and ethylamine afford a better yield, and with less admixed impurity. Thionyl-ethylamine boils at 73°, and in properties closely resembles thionyl-methylamine. Several of the higher members of this and of the aromatic series have been prepared by Prof. Michaelis, and are fully described in his lengthy memoir. It is interesting that in presence of the moisture of the air, or of a small quantity of added water, the thionylamines are converted into compounds of the amines with sulphur dioxide. Those of the aromatic series usually consist of two molecules of the original amine with one molecule of sulphur dioxide. The first few members of the fatty series form compounds consisting of equal molecules of the amine and sulphur dioxide, and the higher members appear capable of forming both classes of compounds.

During the Easter vacation the Port Erin Biological station has been full. The Liverpool Marine Biological Committee organised a dredging expedition, and the steamer *Lady Loch* was hired for some days, during which a trip was made to the deep water lying west of the Isle of Man, and the shallower ground round the Calf Island and off Spanish Head was also explored. On one of the days the calm sea and low tide enabled the wonderful caves near Spanish Head to be visited in a boat from the steamer. The exposed sides, parts of the roof, and as far down as can be seen in the clear water, are closely covered with rounded red ascidians adhering together in masses, black and white sponges, and tufts of *Tubularia,* forming altogether a most striking sight. The sponges are mostly *Pachymatisma johnstoni*, and the ascidians are Alder's *Polycarpa glomerata,* a somewhat variable species solitary specimens of which have been sometimes referred to *Styela rustica* (a species which probably does not occur at all in British seas). Amongst the more noteworthy animals obtained on these recent dredging expeditions were *Virgularia mirabilis, Corynactis viridis, Depastrum cyathiforme, Amphiura chiajii, Palmipes placenta, Porania pulvillus, Stichaster roseus, Luidia ciliaris, Brissopsis lyrifera, Thyone fusus* and *T. raphanus, Hyalinœcia tubicola, Calocaris macandreweœ, Pasiphœa sivado, Xantho tuberculatus, Ebalia tuberosa* and *E. tumefacta, Hippolyte spinus,* a new species of *Metopa, Munida* sp., *Isocardia cor, Lyonsia norvegica, Spirialis retroversus, Fissurella grœca, Capulus hungaricus, Pleurobranchus plumula, Lamellaria perspicua, Dendronotus arborescens, Tritonia hombergi, Eolis tricolor, Eolis angulata, Actœonia corrugata, Scaphander lignarius,* and a new species of the compound ascidian *Glossophorum,* allied to *G. humile,* Lahille, but differing in the colour of the colony and also in minute structure. Prof. Brady and Mr. Thompson obtained a number of interesting Copepoda, including a new *Dactylopus,* and a new and very large *Lichomolgus,* which is found inhabiting *Pecten maximus,* just as *L. agilis* inhabits the common cockle. Since the L. M. B. C. Easter dredging party left Port Erin the following have been working at the station:— Prof. M. C. Potter, Prof. F. E. Weiss, Mr. W. J. Beaumont, Mr. E. T. Browne, and Mr. J. H. Vanstone. Another dredging expedition will be organised for the Whitsuntide vacation.

Notes from the Marine Biological Station, Plymouth.— Last week's captures include the rare Polyclad *Prostheceræus vittatus* and Macruran *Gebia stellata,* and a remarkable haul of the Nudibranch *Hero formosa* whose first capture on our southern coasts was recorded a few weeks ago. The investigation of the floating fauna is much impeded by the continued abundance of gelatinous algæ, which clog the meshes of the townets at all depths. The Leptomedusa *Irene pellucida* is still fairly common, and the pelagic larvæ of *Cereanthus* (*arachnactis*) have now reached a high grade of development. The following animals are now breeding:—The Hydroids *Clava multicornis, Gonothyrœa Loveni, Sertularia pumila* and *Plumularia pinnata;* the Nemertine *Cephalothrix bioculata;* and the Decapod Crustacea *Eupagurus bernhardus* and *Portunus pusillus.*

THE additions to the Zoological Society's Gardens during the past week include a Crowned Gibbon (*Hylobates pileatus*, ♀) from Borneo, presented by Mr. Leicester P. Beaufort; a Bengalese Cat (*Felis bengalensis*) from India, presented by Captain F. Whistler; a White-bellied Hedgehog (*Erinaceus albiventris*) from Somaliland, presented by Mr. H. W. Seton-Karr, F.Z.S.; five Weasels (*Mustela vulgaris*) British, presented by Mr. George Long; a Festive Amazon (*Chrysotis festiva*) from Guiana, presented by Mrs. Hills; a Chinese Lark (*Melanocorypha mongolica*) from China, presented by Mrs. Pollard; two Serin Finches (*Serinus hortulanus*) from south-west Spain, presented by Mr. J. A. Crawford, F.Z.S.; an Undulated Grass Parrakeet (*Melopsittacus undulatus*) from Australia, presented by Mast. W. D. Savory: a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, presented by Mr. E. P. Ramsay; two Hawfinches (*Coccothraustes vulgaris*) British, presented by Mr. A. Klosz; a Magpie Tanager (*Cissopis leveriana*) from south-east Brazil, presented by Mr. H. A. Astlett; two Great Cyclodus (*Cyclodus gigas*) from Australia, presented by Captain Clarke; a Common Viper (*Vipera berus*) British, presented by Mr. Briton Rivière, R.A., F.Z.S.; a Poë Honey-Eater (*Prosthemadera novæ-zealandiæ*) from New Zealand, a Malabar Green Bulbul (*Phyllornis aurifrons*), a Red-eared Bulbul (*Pycnonotus jocosus*) from India, a Cape Coly (*Colius capensis*), two Derbian Zonures (*Zonurus derbianus*) from South Africa, two American Blue Birds (*Sialia wilsoni*) from North America, two Great Eagle Owls (*Bubo maximus*) European, deposited; two Black-necked Swans (*Cygnus nigricollis*, ♂ ♀) from Antarctic America, two Madagascar Love-birds (*Agapornis cana*, ♂ ♀) from Madagascar, a Red-sided Eclectus (*Eclectus pectoralis*, ♂) from New Guinea, purchased; a Red Kangaroo (*Macropus rufus*, ♂) a Great Wallaroo (*Macropus robustus*, ♂), seven Satin Bower Birds (*Ptilonorhynchus violaceus*) from Australia, two Maugés Dasyures (*Dasyurus maugæi*, ♂ ♂), a King Parrakeet (*Aprosmictus scapulatus*), two Diamond Snakes (*Morelia spilotes*), a Water Lizard (*Physignathus lesueuri*) from New South Wales, received in exchange.

OUR ASTRONOMICAL COLUMN.

SOUTH POLAR CAP OF MARS.—During the opposition of Mars in 1892 Prof. George Comstock made a series of determinations of the position angles of the south polar cap of Mars, of its angular extent, and of its polar and equatorial diameter. In the first-mentioned measurements he placed the micrometer thread tangent to the planet's disc, and so rotated it that it was symmetrically situated about the point of tangency; one observation included five settings of this kind, with a determination of the parallel from a neighbouring star, and for the majority of the observations these measurements were made both with telescope east and west. The angular dimensions of the caps were measured by placing the thread tangential to the disc of the planet at the extremities of the cap. The coordinates of the centre of the spot, where θ represents the areographical longitude and λ the south polar distance, together with the diameter of the cap and the adopted corrections to the position angle of the axis of Mars as given by Marth's ephemeris, may be gathered from the following table:—

1892.	Diam. of Cap.	λ	θ	Ephem.
July 26	44°	0°·47	341°	− 2°·26
Aug. 18	35	2·95	311	− 3·06
Sept. 19	22	2·95	336	− 2·66

Prof. Campbell finds the correction to the position angles, as given by Marth's ephemeris as − 0°·16, while Prof. Hall's correction amounts to + 1°·24, both of which vary considerably from the values given above. These differences, as Prof. Comstock points out, may arise from the systematic errors affecting the three methods employed.

The measures of the diameter as made at opposition were as follows:—

Date.	Eq. diam.	Polar diam.
Aug. 5	26″·06	25″·19
,, 6	25·80	25·36
,, 7	26·25	25·67

THE BRIGHTNESS OF THE MAJOR AND MINOR PLANETS.—The latest publication issued from the Astrophysical Observatory at Potsdam (No. 30) contains all Dr. G. Müller's determinations of the brightnesses of both the major and some of the minor planets. These observations extend over a period of about eight years, but the majority were made during the years 1883–85. The first chapter is devoted to a tabulation of the different stars used throughout the work for purposes of comparison. In the second are brought together all the planetary observations, while the third consists of a discussion of the whole number of observations, each planet being independently treated. To state briefly some of the results that these determinations have brought to light we may say: (*a*) That with the exception of the planets Jupiter, Uranus, and Neptune, the variations in brightness are found to be directly dependent on the phase differences, which can be plotted out in simple curves. (*b*) That from the observations of each planet the "Lichtschwankungen" accord with no theory, and that near opposition the variations in brightness are found to be larger than those which should be the case as regards the theoretical values. (*c*) The form of the light curves, when one expresses the brightnesses in stellar magnitudes, approaches very nearly, except in the case of Venus, a straight line, and the variations in magnitude are also very nearly proportional to the corresponding phase-differences. (*d*) The observations give no indication of the dependency of the "Lichtstärke" on the rotation of the planets. And lastly (*e*) that by taking series of observations of the largest planets, obtaining the mean values from different years, differences are found which, as Dr. Müller says, cannot be due to the inaccuracy of the measures or to the fact that the same instruments were not always used. The following table shows clearly the relative brightnesses that result from the above determinations:—

Name of Planet.	Brightness. Distance 1.	App. radius. Distance 1.	Reduced Brightness.	Relative Albedo.	Zöllner's Albedo.
Mercury	−0·003	3″·23	−0·808	0·64	0·43
Venus	−4·004	8·78	−2·638	3·44	2·33
Mars	−1·297	4·68	−1·297	1·00	1·00
Jupiter	−8·932	94·23	−2·412	2·79	2·34
Saturn	−8·685	77·63	−2·586	3·28	1·87
Uranus	−6·858	36·67	−2·388	2·73	2·40
Neptune	−7·053	43·15	−2·229	2·36	1·74

METEOR SHOWERS.—Of the important meteor showers which occur during the present month that which occurs on the sixth exceeds all others in brilliancy. On the evening before and after this date there are also two other showers, but they are much fainter. The positions of the radiant points are, according to Mr. Denning:—

Date.	Radiant.		Meteors.
	R.A.	Decl.	
May 5	254	− 21°	Slowish
,, 6	338	− 2	Swift; streaks
,, 7	224	+ 7	Slow; bright

ASTRONOMY POPULARISED IN AMERICA.—There seems to be no doubt that the interest taken in astronomy in America is rapidly on the increase, and the demands for large telescopes there have played no small part in helping to stir up in many minds the desire for enlightenment in this fascinating science. Increase in the number of students and amateurs, and rapidly growing demands for small telescopes are signs that cannot be misconstrued, indicating as they do the vast interest that even to-day is shown in the oldest of sciences. To satisfy and further these favourable omens, or in other words to bring together those who can instruct into close relations with those who are to be instructed, the editors of *Astronomy and Astrophysics* propose, assuming they get a sufficient number of subscribers, to issue a monthly publication entitled "Popular Astronomy." The idea of this project is that it should serve as a guide for self-instruction, and supply a medium for queries and answers for methods of work, facts, books, &c. They propose to commence